

WHAT IS CLAIMED IS:

- 1 1. A pluripotent embryonic-like stem cell, derived from non-embryonic or  
 2 postnatal animal cells or tissue, capable of self-renewal and capable of differentiation  
 3 to cells of endodermal, ectodermal and mesodermal lineages.
  
- 1 2. The stem cell of Claim 1 which is a human cell.
  
- 1 3. The stem cell of Claim 1 which is isolated from the non-embryonic tissue  
 2 selected from the group of muscle, dermis, fat, tendon, ligament, perichondrium,  
 3 periosteum, heart, aorta, endocardium, myocardium, epicardium, large arteries and  
 4 veins, granulation tissue, peripheral nerves, peripheral ganglia, spinal cord, dura,  
 5 leptomeninges, trachea, esophagus, marrow, stomach, small intestine, large intestine,  
 6 liver, spleen, pancreas, parietal peritoneum, visceral peritoneum, parietal pleura,  
 7 visceral pleura, urinary bladder, gall bladder, kidney, associated connective tissues or  
 8 bone marrow.
  
- 1 4. A pluripotent endodermal stem cell derived from the stem cell of Claim 1.
  
- 1 5. A pluripotent mesenchymal stem cell derived from the stem cell of Claim 1.
  
- 1 6. A pluripotent ectodermal stem cell derived from the stem cell of Claim 1.
  
- 1 7. A endodermal, ectodermal or mesodermal lineage-committed cell derived  
 2 from the stem cell of Claim 1.
  
- 1 8. A culture comprising:  
 2 (a) Pluripotent embryonic-like stem cells, derived from postnatal animal cells or  
 3 tissue, capable of self-renewal and capable of differentiation to cells of endodermal,  
 4 ectodermal and mesodermal lineages; and  
 5 (b) a medium capable of supporting the proliferation of said stem cells.

1 9. The culture of Claim 8, further comprising a proliferation factor or lineage  
2 commitment factor.

1 10. The culture of Claim 8 wherein said stem cells are human cells.

1 11. A method of isolating an pluripotent embryonic-like stem cell, comprising the  
2 steps of:

- 3 (a) obtaining cells from a postnatal animal source;
- 4 (b) slow freezing said cells in medium containing 7.5% (v/v) dimethyl sulfoxide until
- 5 a final temperature of  $-80^{\circ}\text{C}$  is reached; and
- 6 (c) culturing the cells.

1 12. A method of isolating a clonal pluripotent embryonic-like stem cell line,  
2 comprising the steps of:

- 3 (a) obtaining cells from a postnatal animal source;
- 4 (b) slow freezing said cells in medium containing 7.5% (v/v) dimethyl sulfoxide until
- 5 a final temperature of  $-80^{\circ}\text{C}$  is reached;
- 6 (c) culturing the cells;
- 7 (d) diluting said cultured cells to clonal density;
- 8 (e) culturing said diluted cells;
- 9 (e) propagating those cultures having a single cell.

1 13. A clonal pluripotent embryonic-like stem cell line developed by the method of  
2 Claim 12.

1 14. The stem cell of Claim 1 genetically engineered to express a gene or protein of  
2 interest.

1 15. A method of producing a genetically engineered pluripotent embryonic-  
2 likestem cell comprising the steps of:

- 3 (a) transfecting pluripotent embryonic-like stem cells with a DNA construct
- 4 comprising at least one of a marker gene or a gene of interest;

- 5 (b) selecting for expression of the marker gene or gene of interest in the pluripotent  
6 embryonic-like stem cells;  
7 (c) culturing the stem cells selected in (b).

1 16. A genetically engineered pluripotent embryonic-like stem cell produced by the  
2 method of Claim 15.

1 17. The stem cell of Claim 16 which is a human cell.

1 18. A method for detecting the presence or activity of an agent which is a lineage-  
2 commitment factor comprising the steps of:

3 A. contacting the stem cells of Claim 1 with a sample suspected of containing an  
4 agent which is a lineage-commitment factor; and

5 B. determining the lineage of the so contacted cells by mRNA expression, antigen  
6 expression or other means;

7 wherein the lineage of the contacted cells indicates the presence or activity of a  
8 lineage-commitment factor in said sample.

1 19. A method of testing the ability of an agent, compound or factor to modulate  
2 the lineage-commitment of a lineage uncommitted cell which comprises

3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the  
4 stem cells as lineage uncommitted cells;

5 B. adding the agent, compound or factor under test; and

6 C. determining the lineage of the so contacted cells by mRNA expression, antigen  
7 expression or other means.

1 20. An assay system for screening agents, compounds or factors for the ability to  
2 modulate the lineage-commitment of a lineage uncommitted cell, comprising:

3 A. culturing the stem cells of Claim 1 in a growth medium which  
4 maintains the stem cells as lineage uncommitted cells;

5 B. adding the agent, compound or factor under test; and

6 C. determining the lineage of the so contacted cells by mRNA expression, antigen  
7 expression or other means.

1 21. A method for detecting the presence or activity of an agent which is a  
2 proliferation factor comprising the steps of:  
3 A. contacting the stem cells of Claim 1 with a sample suspected of  
4 containing an agent which is a proliferation factor; and  
5 B. determining the proliferation and lineage of the so contacted cells by  
6 mRNA expression, antigen expression or other means;  
7 wherein the proliferation of the contacted cells without lineage commitment indicates  
8 the presence or activity of a proliferation factor in said sample.

1 22. A method of testing the ability of an agent, compound or factor to modulate  
2 the proliferation of a lineage uncommitted cell which comprises  
3 A. culturing the stem cells of Claim 1 in a growth medium which  
4 maintains the stem cells as lineage uncommitted cells;  
5 B. adding the agent, compound or factor under test; and  
6 C. determining the proliferation and lineage of the so contacted cells by mRNA  
7 expression, antigen expression or other means.

1 23. An assay system for screening agents, compounds or factors for the ability to  
2 modulate the proliferation of a lineage uncommitted cell, comprising:  
3 A. culturing the stem cells of Claim 1 in a growth medium which maintains the  
4 stem cells as lineage uncommitted cells;  
5 B. adding the agent, compound or factor under test; and  
6 C. determining the proliferation and lineage of the so contacted cells by mRNA  
7 expression, antigen expression or other means.

1 24. A method of transplanting pluripotent embryonic-like stem cells in a host  
2 comprising the step of introducing into the host the stem cells of Claim 1.

1 25. A method of providing a host with purified pluripotent embryonic-like stem  
2 cells comprising the step of introducing into the host the pluripotent embryonic-like  
3 stem cells of Claim 1.

1 26. A method of *in vivo* administration of a protein or gene of interest comprising  
2 the step of transfecting the pluripotent embryonic-like stem cell of Claim 1 with a  
3 vector comprising DNA or RNA which expresses a protein or gene of interest.

1 27. A method of preventing and/or treating cellular debilitations, derangements  
2 and/or dysfunctions and/or other disease states in mammals, comprising administering  
3 to a mammal a therapeutically effective amount of pluripotent embryonic-like stem  
4 cells, or cells or tissues derived therefrom.

1 28. A method of tissue repair or transplantation in mammals, comprising  
2 administering to a mammal a therapeutically effective amount of pluripotent  
3 embryonic-like stem cells, or cells or tissues derived therefrom.

1 29. A method of preventing and/or treating cellular debilitations, derangements  
2 and/or dysfunctions and/or other disease states in mammals, comprising administering  
3 to a mammal a therapeutically effective amount of a endodermal, ectodermal or  
4 mesodermal lineage-committed cell derived from the stem cell of Claim 1.

1 30. A method of tissue repair or transplantation in mammals, comprising  
2 administering to a mammal a therapeutically effective amount of a endodermal,  
3 ectodermal or mesodermal lineage-committed cell derived from the stem cell of  
4 Claim 1.

1 31. A pharmaceutical composition for the treatment of cellular debilitation,  
2 derangement and/or dysfunction in mammals, comprising:  
3 A. a therapeutically effective amount of pluripotent embryonic-like stem cells, or  
4 cells or tissues derived therefrom; and  
5 B. a pharmaceutically acceptable medium or carrier.

1 32. The pharmaceutical composition of Claim 28 further comprising a  
2 proliferation factor or lineage-commitment factor.